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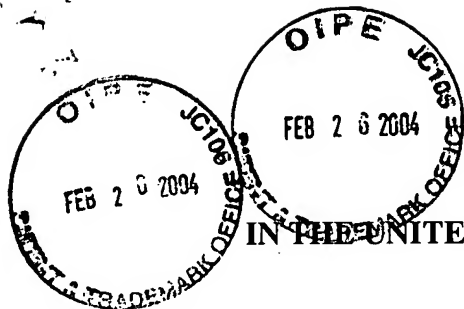
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DT07 Rec'd PCT/PTO 26 FEB 2004



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Via Express Mail: EV351235502US

Applicant : Heru Prasanta Wijaya  
Application No. : PCT/IB01/01198  
Filed : June 29, 2001  
Title : AIR-STIRRING BLADE FOR AN INTERNAL COMBUSTION ENGINE  
  
Grp./Div. : N/A  
Examiner : N/A  
  
Docket No. : 51770/DBP/R130

PETITION TO REVIVE UNDER 37 CFR § 1.137(b)

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Post Office Box 7068  
Pasadena, CA 91109-7068  
February 26, 2004

Commissioner:

Applicant hereby petitions to revive the above-identified International Application in the US to permit filing of a continuation application under 35 USC 120.

Enclosed is a Declaration of the applicant, Heru Prasanta Wijaya evidencing the fact that the delay in entering the National Stage of the International Application in the US was unintentional. Also enclosed are the following for the continuation application:

- Utility Patent Application Transmittal  
Adjustment date: 05/28/2004 MCLAYBRO  
03/09/2004 SHAJARRO 00000029 PCT/IB01/01198  
01 FC:2453 - 665.00 OP

- Clean Copy of Specification, claims and Abstract of International Application No. PCT/IB01/01198 for examination

05/28/2004 MCLAYBRO 00000001 10789356  
01 FC:2453

- Declaration and Power of Attorney for Patent Application  
- Verified Statement (Declaration) Claiming Small Entity Status-Independent Inventor  
- 665.00 OP

- Preliminary Amendment  
03/09/2004 SHAJARRO 00000029 PCT/IB01/01198  
01 FC:2453 665.00 OP

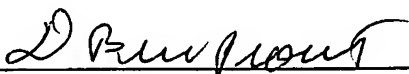
Application No.: N/A

- Information Disclosure Statement

The check for the petition fee in the amount of \$665 and papers for the filing of the continuation application are enclosed.

Respectfully submitted,

CHRISTIE, PARKER & HALE, LLP

By   
D. Bruce Prout  
Reg. No. 20,958  
626/795-9900

DBP/djp  
Enclosures: New Application  
Check

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28 MAY 2004

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D. Bruce Prout  
Christie, Parker & Hale, LLP  
P.O. Box 7068  
Pasadena, CA 91109-7068

In re Application of :  
WIJAYA, Heru, Prasanta :  
U.S. Application No.: 10/789,356 : **DECISION ON PETITION**  
Filing Date: 24 February 2004 : **UNDER 37 CFR 1.137(b)**  
Attorney Docket No.: 51770/DBP/R130 :  
For: AIR-STIRRING BLADE FOR AN INTERNAL :  
COMBUSTION ENGINE :

This is a decision on applicant's "Petition to Revive under CFR 1.137(b)" filed 24 February 2004 in the above-captioned application. The petition fee under 37 CFR 1.17(m) has been paid.

### **BACKGROUND**

On 29 June 2001, applicant filed international application PCT/IB01/01198 which claimed no priority date. A copy of the international application was communicated to the United States Patent and Trademark Office from the International Bureau on 16 January 2003. Pursuant to 37 CFR 1.495, the deadline for payment of the basic national fee in the United States was to expire 30 months from the international filing date, 24 December 2003.

On 24 February 2004, applicant filed the present petition to revive pursuant to 37 CFR 1.137(b) accompanied by a continuation application.

### **DISCUSSION**

A petition under 37 CFR 1.137(b) requesting that the application be revived on the grounds of unintentional abandonment must be accompanied by (1) the required reply, (2) the petition fee required by law, (3) a statement that the, "entire delay in filing the required reply from the due date for the reply until the filing of a grantable petition pursuant to this paragraph was unintentional" and (4) any terminal disclaimer and fee pursuant to 37 CFR 1.137(c) (where required).

Regarding item (1), applicant has supplied the proper reply in the form of the filing of a continuation application.

As to item (2), the petition fee has been submitted.

With regard to Item (3), applicant's statement that "entire delay in filing the 35

U.S.C. 371(c) requirement from their due date until the filing of a grantable petition under 37 CFR 1.137(b) was unintentional” and the prompt filing of the petition satisfies the requirement of 37 CFR 1.137(b)(3).

As to Item (4), the terminal disclaimer is not required since this application was filed after 08 June 1995.

### CONCLUSION

Applicant's petition to revive for the purposes of continuity only is GRANTED.

International application PCT/IB01/01198 is being revived for purposes of continuity only and since continuity has been established by this decision reviving the international application, the international application is again abandoned.

This application is being returned to the Office of Initial Patent Examination (OIPE) for processing as an application filed under 35 U.S.C. 111(a).



Anthony Smith  
Attorney-Advisor  
Office of PCT Legal Administration  
Tel.: 703-308-6314  
Facsimile: 703-308-6459

Applicant : Heru Prasanta Wijaya  
Application No. : PCT/IB01/01198  
Filed : June 29, 2001  
Title : AIR-STIRRING BLADE FOR AN INTERNAL COMBUSTION ENGINE  
Docket No. : 51281/DBP/R178

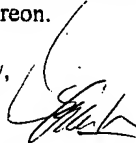
**DECLARATION OF HERU PRASANTA WIJAYA**

I hereby declare and state as follows:

1. I am the sole inventor of the subject application.
2. The subject application became abandon for failure to enter the National Stage in the U.S.
3. The failure to file under the National Stage in the U.S. and the resulting abandonment of the subject application were the result of an unintentional delay.

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully,



Heru Prasanta Wijaya

Date: 29.01.2004 HP

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BOR Fax (021) 576 - 2301 ; 576 - 2302 ; 576 - 2303

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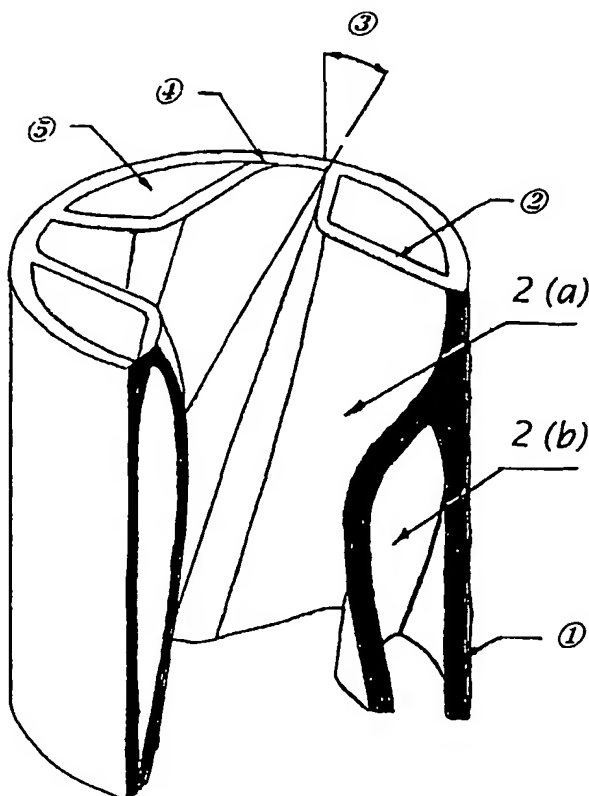
(43) International Publication Date  
16 January 2003 (16.01.2003)

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(10) International Publication Number  
**WO 03/004854 A1**

- (51) International Patent Classification<sup>7</sup>: **F02M 29/06** (81) Designated States (*national*): AU, BR, CA, CN, DE, ES, FI, GB, ID, IN, JP, KP, KR, MX, NZ, RO, SE, SG, US, VN, YU.
- (21) International Application Number: **PCT/IB01/01198**
- (22) International Filing Date: **29 June 2001 (29.06.2001)** (84) Designated States (*regional*): Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).
- (25) Filing Language: **English**
- (26) Publication Language: **English**
- (71) Applicant and  
(72) Inventor: **WIJAYA, Heru, Prasanta [ID/ID]; Graha Famili D.183, PR. Kali Kendal, Surabaya 60226 (ID).**
- (74) Agent: **PRIAPANTJA, Cita, Citrawinda; Biro Oktroi Roosseno, Kantor Taman A-9, Unit C1 - C2, J1. Mega Kuningan, Kuningan, Jakarta 12920 (ID).**
- Published:**  
— with international search report  
— with amended claims
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **AIR-STIRRING BALDE FOR AN INTERNAL COMBUSTION ENGINE**



(57) Abstract: Air-stirring balde for producing an agitating effect within an internal combustion engine has been disclosed in PCT/IB99/00029. The turbulency performed by the velocity of the air-fuel mixture leaving the outlet part of this device however is still low enough. The air-stirring blade of this invention comprises a cylindrical body (1) whose mid portion is provided with blade (2) of such a construction that the inner side of the blade (2a) takes the form of stirred grooves with dip angle (3) of about 10° to 80° or typically 30° with respect to vertical axis of the body. The outer side of the blade (2b) is of the same shape with the innre side (2a) thereof and there are four tangent lines (4) between blade (2) and body (1) forming a channel of cap-shaped cross-section (5) which is twisted along body (1). The preferred embodiments of this air-stirring blade as some related modifications as well.

WO 03/004854 A1

Description

## AIR-STIRRING BLADE FOR AN INTERNAL COMBUSTION ENGINE

## 5    Technical Field of Invention

10    This invention relates to an inlet for air from the atmosphere into an internal combustion engine attached particularly before the engine air filter and after the combustion engine.

## Background of invention

15    In order to be leading in current technology, an internal combustion engine mounted in automotive vehicles should reveal a good performance. To have a good performance, an internal combustion engine should have a sufficient acceleration and an optimal use of fuel. These requirements can be met by improving quality of the combustion process of air-fuel  
20    mixture within the engine.

Another way of improving the quality of combustion process of air-fuel mixture within an automotive engine is to improve the quality of air-fuel mixture. A qualified combustion process of air-fuel mixture requires that an  
25    agitating effect should occur within the mixture. An agitating effect is a phenomenon triggered and left by a stirring effect in air before the air is mixed with the fuel.

The stirring effect is recently produced by providing auxiliaries such as grooves in the air inlet. The grooves are  
30    of many types and each has its own advantage and drawback.

The prior art related to this present invention is Air-Stirring Device for Automotive Vehicles (PCT/IB99/00029).

The object of this invention is thus to improve the quality of air-fuel mixture by generating a twisting effect,  
35    maintain it as long as possible and increase the turbulency of the air-fuel mixture leaving the outlet side of the air-stirring blade.

## Summary of The invention

As disclosed above, the subject of this invention is a device which enables the atmosphere flow turbulently into the engine of automotive vehicles. Compared with the prior art cited above, i.e., PCT /IB99/00029, one of the advantages possessed by this present invention is an increasing turbulency of the air-fuel mixture leaving the outlet part of this air-stirring blade due to lesser air-resistance or loss of head.

The location of this air stirring blade with carburetor within an automotive engine is shown schematically in Fig. 1. Air-stirring blade (F) is mounted after or on air channel (B) and before carburetor (C). Fig. 2 shows schematically the air-stirring blade if mounted within an internal combustion engine on channel (B) after air filter (A) and before engine combustion chamber (E) by means of an injection system.

The preferred embodiment of this invention (shown in Fig.3) comprises a cylindrical body (1) whose mid portion is provided with blade (2) constructed in such a way that the inner side of the blade (2a) takes the form of stirred grooves with dip angle (3) of about  $10^{\circ}$  to  $80^{\circ}$  or typically  $30^{\circ}$ . The shape of the outer side of the blade (2b) is the same with that of the inner side (2a) of the blade. There are four tangent lines between blade (2) and body (1). The four tangent lines form a channel with cap-shaped cross-section (5) which is twisted along body (1).

Figure 3 is a preferred embodiment of this invention whilst Figure 4 and 5 are its modifications. It can be seen from Figures 3, 4 and 5 that the air flowing from this air-stirring blade is in stirred condition enabling the occurrence of an agitating effect within the air-fuel mixture.

## Brief Description of the Drawing

Figure 1 shows schematically the mounting of an air-

stirring blade within an internal combustion engine with carburetor where A, B, C, D, E are successively air filter, air channel, carburetor, intake manifold, engine combustion chamber, and air-stirring device.

5        Figure 2 shows schematically the mounting of air-stirring device within an internal combustion engine using an injection system, where A, B, D, E and F are successively air filter, air channel, intake manifold, engine combustion chamber, and air-stirring device.

10       Figure 3 is a preferred embodiment of this invention where where (1), (2), (3), (4) and (5) are successively body, blade, dip of twisting, tangent lines, and twisted channel.

Figure 4 is a modification of this invention in the form blade only, without body,

15       Figure 5 is other modifications of this invention where Figure 5a is an air-stirring device which is provided with lips on its body, Figure 5b is an air stirring device acting as a joint for air channel, and Figure 5c is an air stirring device which is integrally constructed with an air channel.

20       Figure 6 is a table showing performance of an internal combustion engine of standard type equipped successively with air twisting device disclosed in PCT/IB99/00029 and air-stirring device of present invention.

25       Figure 7 is a experimentally-derived graph showing the relation between fuel consumed and power yielded by an internal combustion engine of standard type, equipped with air twisting-device disclosed in PCT/IB99/00029, and equipped with air-stirring device of present invention, respectively.

### 30 Detailed Description of the Invention

The purpose of this invention is to improve the performance of an automotive engine without any significant changes in the previous design of the engine. A satisfied  
35 result in the form of a well stirred air flowing into the automotive engine can be performed by optionally attaching an air-stirring device on the engine.

Air-stirring device that can be attached without necessarily changing the engine construction has been disclosed in PCT/IB99/00029.

The turbulency of the air-fuel mixture leaving the outlet  
5 part of the air-stirring device disclosed in PCT/IB99/00029 is considerably lower than that of this invention.

Based on that fact, the aim of this present invention is thus to insure as well as to increase the turbulency of the air-fuel mixture leaving the outlet part of the device  
10 disclosed in PCT/IB99/00029 by means of a twisted air channel (5) attached on the solid portion of the air-stirring device disclosed in PCT/IB99/00029.

The attachment of the air-stirring device presently invented on an internal combustion engine is shown in Figure  
15 1. This air-stirring device (F) is attached after the air channel (B) or on the air channel (B) but before the carburetor (C). Such position of attachment is intended to provide an airflow which has been twisted before entering the carburetor (C). Since the air has been twisted before entering  
20 the carburetor (C), the air-fuel mixture entering the engine combustion chamber (E) will have been twisted as well and agitated. To achieve an optimal agitating effect, this air-stirring device (F) is attached in an internal combustion engines not on one place only, but on other places as well  
25 such as on the air channel (B) or in the front of intake manifold (D).

The preferred embodiment of this invention (shown in Figure 3) comprises a cylindrical body (1) provided with blade (2) which is shaped in such a way that the inner side of the  
30 blade (2a) takes the form of stirred grooves with dip angle (3) of about  $10^{\circ}$  to  $80^{\circ}$  or typically  $30^{\circ}$  with respect to vertical axis of the body. The the outer side of the blade (2b) is of the same shape with the inner side (2a) thereof. The four tangent lines between blade (2) and body (1) form a  
35 channel of cap-shaped cross-section (5) which is twisted along body (1). The number of tangent lines (4) between body (1) and blade (2) is dictated by the number of groove performed on the

blade (2); it is not always four as cited above. The minimum number of groove is usually two but more grooves are allowed when needed.

Tests are conducted by comparing measured parameters of an internal combustion engine mounted on powered vehicles using injection system on standard condition (without air-stirring device), using air-stirring device disclosed in PCT/IB99/00029, and using the air-stirring blade presently invented. The parameters were measured for each condition under specified rpms of the internal combustion engine. Parameters observed in the test is the time needed to use up a 25 ml fuel, the engine rpm at that time and the related power of the engine. Power is measured by dynamometer.

The data obtained are tabulated in Figure 6. The fuel consumed per second calculated from data shown in Figure 6 is then interrelated to the power of the engine. The graph produced is shown in Figure 7.

Figure 7 shows that to produce the same power at all rpms the internal combustion engine equipped with the air-stirring blade presently invented consumes less fuel than the same engine equipped with air-stirring device disclosed in PCT/IB99/00029 and the internal combustion engine equipped with nothing. With respect to PCT/IB99/00029, at rpms below 3500, the internal combustion engine equipped with air-stirring blade presently invented consumes less fuel to produce power of the same rate. However at rpm of 1500, the internal combustion engine equipped with air-stirring blade presently invented and the internal combustion engine equipped with the device disclosed in PCT/IB99/00029 consume fuel of the same amount.

Figure 3 is a preferred embodiment of this invention whilst Figure 4 and 5 show modifications thereof. Modification in Figure 4 is in the form of blade (2) only following the omission of the cylindrical parts of its body (1). Modification in Figure 4 is possible if the air-stirring blade acts as an inserting part and body (1) of the air-stirring blade is of such construction that it looks to be integrated

with the air channel within the internal combustion engine.

Figure 5a shows another modification of this invention where body (1) is equipped with additional lip (6).

Figure 5b is another modification of this invention in which the blade acts as a joint for air channel, and Figure 5c is an air-stirring device which is integrally constructed with the body of an air channel.

Most of those modifications are made of nonmetal materials such as polymer. Only a few of them are made of metal.

It should necessarily be understood that the scope of this invention is not limited by the embodiments represented by the appended drawings. All modifications made by the people skilled in this art are still part of this invention as long as the principles underlying the modifications still exist within the scope of the invention.

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## Claims

1. An air-stirring blade to be mounted within an internal combustion engine, characterized by  
5 a cylindrical body (1) whose mid portion is provided with blade (2) constructed in such a way that the inner side of the blade (2a) takes the form of stirred grooves with dip angle (3) of about 10° to 80° or typically 30° with respect to vertical axis of the body; and  
10 the outer side of the blade (2b) which is of the same shape with the inner side (2a) thereof, the existence of two or more, generally four tangent lines (4) between blade (2) and body (1) which form a channel of cap-shaped cross-section (5) which is twisted along  
15 body (1).
2. Air-stirring blade in claim 1 whose shape has been modified so as to show a blade (2) only after the omission of the cylindrical parts of its body (1).  
20
3. Air-stirring blade in claim 1 which is modified as a body (1) equipped with additional lip (6).
4. Air-stirring blade in claim 1 which is modified in such  
25 so that the blade is integrally constructed with the air channel and acts a joint for air channel.
5. Air-stirring blade in claim 1 which can be made of  
30 nonmetal materials such as polymer or metal.



**AMENDED CLAIMS**

[received by the International Bureau on 19 April 2002 (19.04.02);  
original claims 1-5 replaced by new claims 1-6 (1 page)]

1. An air-stirring blade to be mounted within an internal combustion engine, characterized by,

a cylindrical body (1) whose mid portion is provided with blade (2) constructed in such a way that the inner side of the blade (2a) takes the form of stirred grooves with dip angle (3) of about 10° to 80° or typically 30° with respect to vertical axis of the body, and this blade makes a twisted center tunnel as inner passage; and

the outer side of the blade (2b) which is of the same shape with the inner side (2a) thereof, the existence of two or more, generally four tangent lines (4) between blade (2) and body (1) which form channel of cap-shaped cross section (5) which is twisted along body, as outer passage.

2. Air-stirring blade in claim 1 whose shape has been modified so as to show a blade (2) only after the omission of the cylindrical parts of its body (1)

3. Air-stirring blade in claim 1 which is modified as a body (1) equipped with additional lip (6)

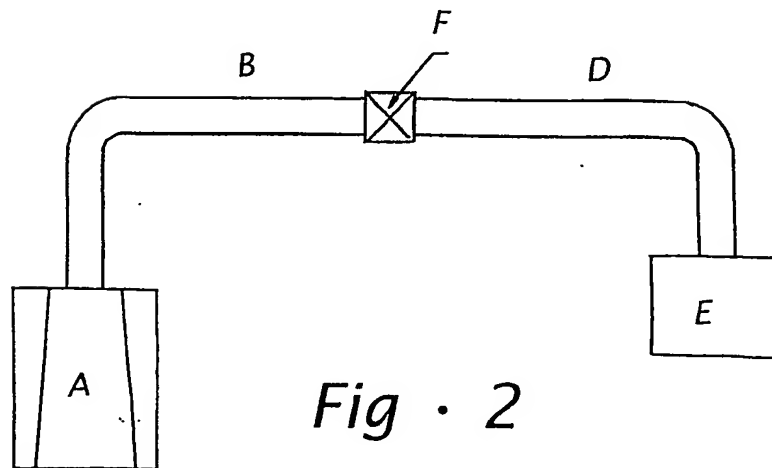
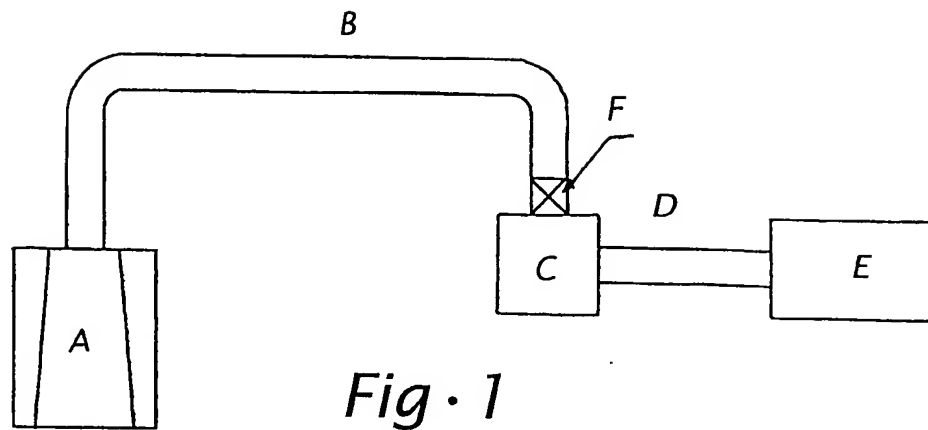
4. Air-stirring blade in claim 1 which modified in such so that the blade is integrally constructed with the air channel and acts a joint for air channel.

5. An air-stirring blade to be mounted within an internal combustion engine, characterized by,

a blade (2) constructed in such a way that the inner side of the blade (2a) takes the form of two or more of coiled grooves with each coiled grooves has dip angle (3) of about 10° to 80° or typically 30° with respect to vertical axis of the body, and this blade makes a twisted center tunnel as inner passage; and

the outer side of the blade (2b) which is of the same shape with the inner side (2a), and if inserted to the air duct will has tangent lines (4) between blade (2) and air duct which form channel which is twisted along body of air duct, as outer passage.

6. Air-stirring blade in claim 1 and claim 5 which can be made of nonmetal materials such as polymer or metal.



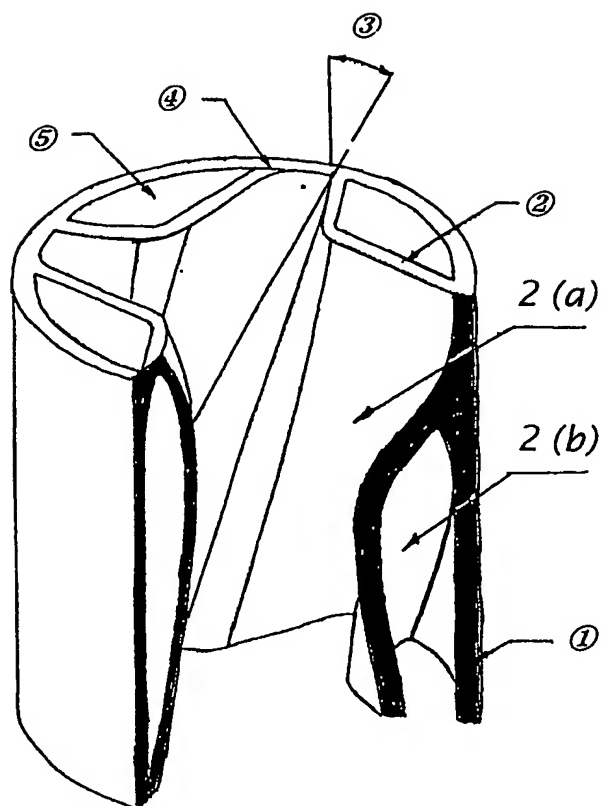


Fig . 3

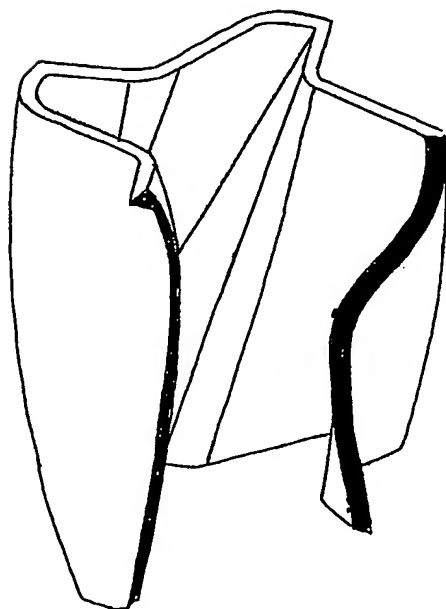
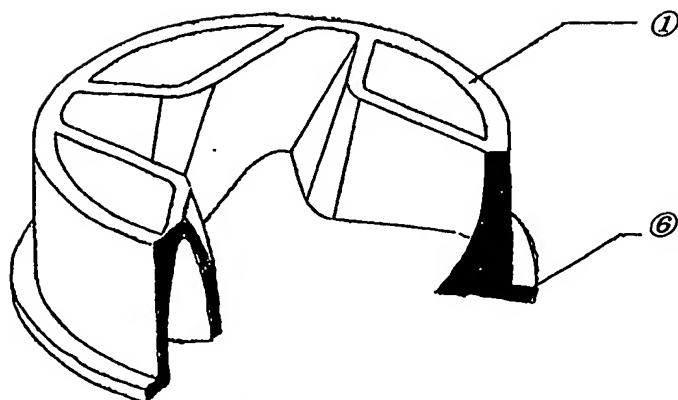
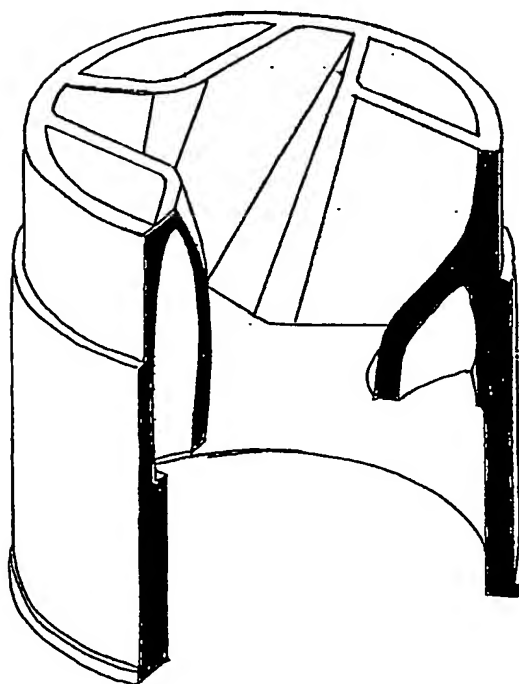


Fig . 4

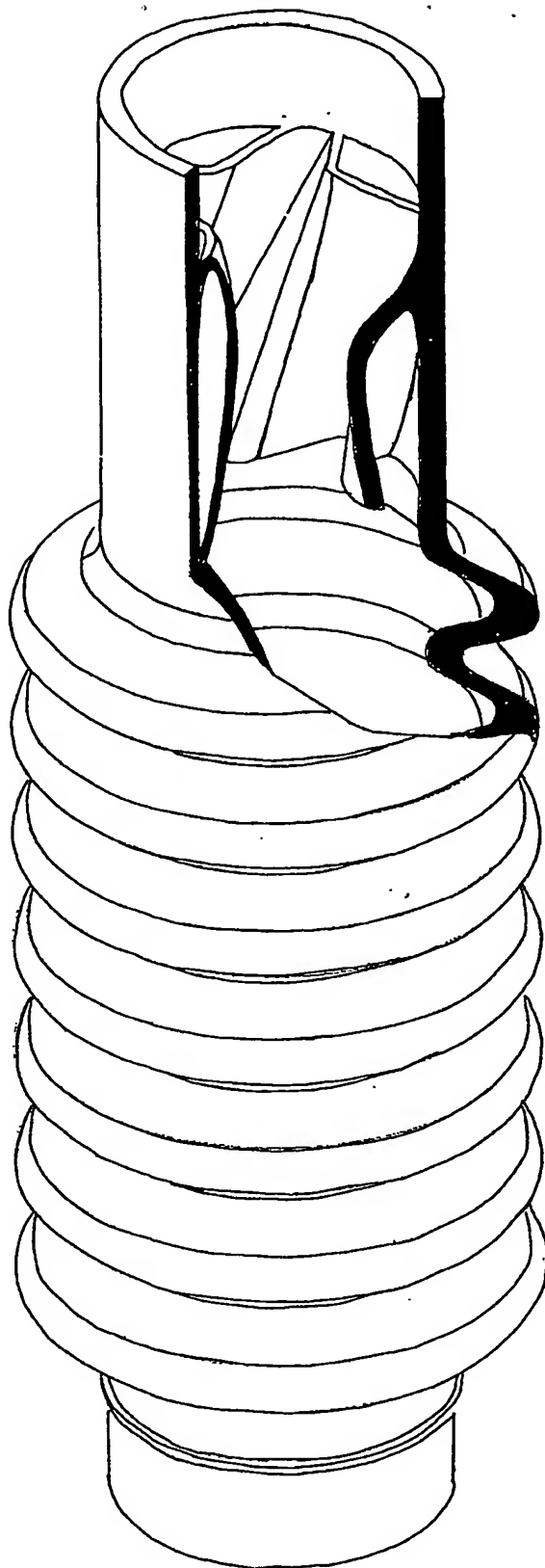


*Fig · 5a*



*Fig · 5b*

4/5



*Fig · 5c*

Test results showing the relation between fuel consumed (in secs) and power produced (in hp) by an internal combustion engine using three different types of air-twisting device

No	Machine rpm	Standard		PCT/IB99/0029		New Invention	
		Power (hp)	Fuel (Sec)	Power (hp)	Fuel (Sec)	Power (hp)	Fuel (Sec)
1	1.000	2	48.16	3	51.05	4	68.20
2	1.500	15	24.78	15	46.58	17	37.16
3	2.000	25	13.99	26	19.91	26	31.60
4	2.500	35	8.63	38	15.35	41	18.73
5	3.000	49	6.66	50	10.68	56	14.54
6	3.500	67	5.55	66	8.57	73	7.41
7	4.000	81	4.90	82	6.01	91	4.96
8	4.500	101	3.37	102	3.39	99	3.34

- Fuel in secs refers to the time needed to use up a 25 ml bulb
- Power Produced is power transmitted by wheel to dynamometer

Fig · 6

Graphs showing the relation between normal fuel consumption and power

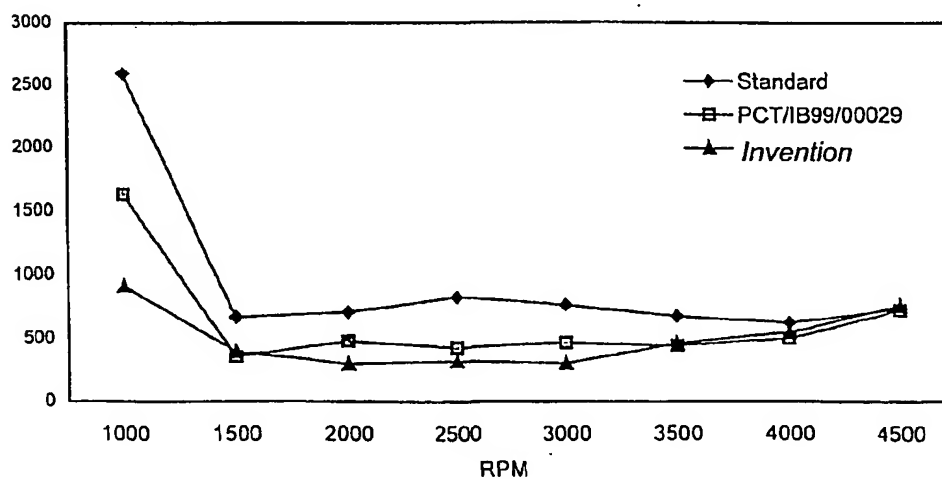


Fig · 7

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 01/01198

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 F02M29/06

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 F02M

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2001/001388 A1 (BUSWELL CRAIG L ET AL) 24 May 2001 (2001-05-24) page 3, line 1 -page 7, line 50; figures 1-7	1-5
X	DE 30 02 325 A (HEIM GERHARD) 30 July 1981 (1981-07-30) page 12, line 5 -page 16, line 6; figure 1	1-3,5
X	WO 94 02735 A (CHO BYOUNG MIN) 3 February 1994 (1994-02-03) page 2, line 15 -page 6, line 14; figures 1-8	1-3,5
X	US 4 151 816 A (SCHRODER JOACHIM) 1 May 1979 (1979-05-01) page 2, line 49 -page 4, line 48; figures 1-5	1-4
	-/-	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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- \*O\* document referring to an oral disclosure, use, exhibition or other means
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Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax. (+31-70) 340-3016

Authorized officer

Marsano, F

## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 01/01198

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 3 395 899 A (KOPA RICHARD D) 6 August 1968 (1968-08-06) column 5, line 58 -column 11, line 74; figures 1,3	1-3
X	BE 347 113 A (G ROMEDENNE) 31 January 1928 (1928-01-31) page 1, line 1 -page 3, line 21; figures 1,2	1-4
A	WO 00 06889 A (WIJAYA HERU PRASANTA) 10 February 2000 (2000-02-10) page 2, line 6 -page 3, line 30; figure 1B	1-5



## INTERNATIONAL SEARCH REPORT

International Application No

PCT/IB 01/01198

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
US 2001001388	A1	24-05-2001	US	6170460 B1	09-01-2001
DE 3002325	A	30-07-1981	DE	3002325 A1	30-07-1981
WO 9402735	A	03-02-1994	KR	9501983 Y1	23-03-1995
			AU	4587093 A	14-02-1994
			EP	0604634 A1	06-07-1994
			WO	9402735 A1	03-02-1994
US 4151816	A	01-05-1979	DE	2637985 A1	02-03-1978
			BR	7705623 A	25-04-1978
			CH	622584 A5	15-04-1981
			DK	371877 A ,B,	25-02-1978
			FR	2362997 A1	24-03-1978
			GB	1583580 A	28-01-1981
			IT	1079830 B	13-05-1985
			JP	1295649 C	26-12-1985
			JP	53041626 A	15-04-1978
			JP	60017922 B	08-05-1985
			NL	7709053 A ,B,	28-02-1978
US 3395899	A	06-08-1968	NONE		
BE 347113	A		NONE		
WO 0006889	A	10-02-2000	AU	736708 B2	02-08-2001
			AU	1777299 A	21-02-2000
			EP	1017935 A1	12-07-2000
			WO	0006889 A1	10-02-2000